23

Claims

1.      A method (300) of determining per-cell traffic
coverage in a cellular communication system that
comprises multiple cells, the method characterised by the
steps of:
        receiving measurements of one or more parameters
relating to one or more operations of a first cell in a
cellular communication system, wherein said one or more
parameters includes information relating to whether a
wireless subscriber communication unit can be served by a
number of cells or uniquely served by the first cell; and
        calculating (310, 315) a degree of coverage
overlap for said first cell based on a number of said
measurements, wherein
        said measurements are partitioned (310) into one
or more of at least three categories with respect to the
first cell, wherein:
        (i) A first category is where the measurement
indicates a wireless subscriber unit that is uniquely
served by the first cell,
        (ii) A second category where the measurement
indicates a wireless subscriber unit that can be served
by a number of cells, and
        (iii) A third category where the measurement
indicates a wireless subscriber unit that is served by a
neighbouring cell but could be served by the first cell.


2.      The method (300) of determining per-cell traffic
coverage in a cellular communication system according to
Claim 1, wherein the step of calculating (310, 315) a
degree of coverage overlap based on a number of said

24

measurements employs a statistically valid sample of said
measurements.

3.      The method (300) of determining per-cell traffic
5    coverage in a cellular communication system according to
any preceding Claim, wherein the step of calculating
(310, 315) comprises determining an unique coverage
factor (UCF) for that cell, where:

10          · UCF = <u>Sum of MRs with no and/or weak neighbours</u>
                              Total Sum of MRs

4.      The method (300) of determining per-cell traffic
coverage in a cellular communication system according to
15    any preceding Claim, the method further characterised by
the step of:
        converting (315) a number of measurements to
Erlangs to determine a coverage overlap based on
subscriber traffic within said cell.
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5.      The method (300) of determining per-cell traffic
coverage in a cellular communication system according to
any preceding Claim, the method further characterised by
the step of:
25          allocating a priority, for example an alarm
priority, to said cell based on said calculation.

6.      The method (300) of determining per-cell traffic
coverage in a cellular communication system according to
30    any preceding Claim, the method further characterised by
the step of:
        re-configuring (335) an operational parameter of
said cell, for example a transmit power, a beam-forming

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antenna tilt or direction, or turning off a cell, in
response to said calculation.

7.      The method (300) of determining per-cell traffic
coverage in a cellular communication system according to
any preceding Claim, the method further characterised by
the steps of:
        storing said calculations; and
        using (330) said stored calculation subsequently
to determine a cell outage strategy.

8.      The method (300) of determining per-cell traffic
coverage in a cellular communication system according to
any preceding Claim, wherein the steps of measuring and
calculating are used in an automatic frequency planning
operation of said cellular communication system.

9.      The method (300) of determining per-cell traffic
coverage in a cellular communication system according to
any preceding Claim, wherein the wireless communication
unit (146) receives measurement reports from a wireless
serving communication unit, for example a base
transceiver station (122-132), or a wireless subscriber
communication unit (112-116).

10.     A storage medium storing processor-implementable
instructions for controlling a processor to carry out the
method steps of any of claims 1 to 9.

11.     A communication system (100) adapted to perform
the steps of any of method Claims 1 to 9, the
communication system (100) comprising an overlapping
coverage calculation function (155).

26

12.    A communication unit (146) for use in a cellular
communication system that comprises multiple cells, the
communication unit (146) comprising:
         a receiving function for receiving measurements
5  of one or more parameters relating to one or more
operations of a first cell in said cellular communication
system; and
         a processor, operably coupled to said receiving
function, to process said received data,
10 the communication unit characterised in that said
processor calculates a degree of coverage overlap based
on a number of said measurements, wherein:
         said processor partitions said received
measurements into at least one of three categories with
15 respect to the first cell, wherein:
         (i) A first category indicates a wireless
subscriber unit that is uniquely served by the first
cell,
         (ii) A second category where the measurement
20 indicates a wireless subscriber unit that can be served
by a number of cells, and
         (iii) A third category where the measurement
indicates a wireless subscriber unit that is served by a
neighbouring cell but is located such that it could be
25 served by the first cell.

13.    The communication unit according to Claim 12,
wherein said processor determines an unique coverage
factor for a cell (UCF); where:

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          UCF = $\underline{\text{Sum of MRs with no and/or weak neighbours}}$
                          Total Sum of MRs

27

14.      The communication unit according to any of
preceding Claims 12 and 13, wherein said processor
converts a number of measurements to Erlangs to determine
a coverage overlap based on subscriber traffic within
5    said cell.

15.      The communication unit according to Claim 14,
wherein said processor allocates a priority, for example
an alarm priority, to said cell based on said
10   calculation.

16.   .  The communication unit according to any of
preceding Claims 12 to 15, wherein said communication
unit or a unit operably coupled to the communication unit
15   re-configures one or more operational parameters of said
cell in response to said calculation.

17. ·     The communication unit according to Claim 16,
wherein said communication unit configures said cell for
20   transmit power changes, beam-forming antenna changes,
and/or switching off said cell site.

18.      The communication unit according to any of
preceding Claims 12 to 17, wherein said communication
25   unit is an operations and management centre (146)
configured to receive measurement report data relating to
cells in said cellular communication system.

19.      The communication unit according to any of
30   preceding Claims 12 to 18, wherein said measured data
includes one or more of the following:

28

(i) Cell statistical information, for example in
the form of Congestion, Blocking, Mean-Hold Time (MHT),
Handover (HO) Cause distribution information;

(ii) One or more Measurement Reports; or

5          (iii) Control Signalling behaviour.


20.     The communication unit according to any of
preceding Claims 12 to 19, wherein said processor is
operably coupled to a memory device for storing said
10   calculations for subsequent use in determining a cell
outage strategy.


21.     The communication unit according to any of
preceding Claims 12 to 20, wherein said communication
15   unit is able to communicate on a GSM, GPRS, UMTS, iDEN,
or CDMA cellular communication system.